इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 14381 (1996): Automotive vehicles - Electrical circuits - Recommended graphical symbols [TED 11: Automotive Electrical Equipment]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS 14381 : 1996

(Reaffirmed 2001)

भारतीय मानक

स्वचल वाहन — विद्युतीय परिपथ — ग्राफीय प्रतीकों की सिफारिशें

Indian Standard

AUTOMOTIVE VEHICLES — ELECTRICAL CIRCUITS — RECOMMENDED GRAPHICAL SYMBOLS

ICS 43.040.10 ; 01.080.30

© BIS 1996

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 1996

Price Group 8

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Electrical Equipment Sectional Committee had been approved by the Transport Engineering Division Council.

In the automotive field, there is an ever increasing use of electrical and electronic devices to operate various systems. In order that the system design is easily understood by assembly line as well as for ensuring proper maintenance later, it is necessary that the circuit diagrams for the various systems are standardized. The symbols, controls and tell tales for automotive vehicles in many cases have already been standardized.

This standard is based on the East German Standard TGL 16058 'Graphical symbols used in electrical engineering — Electrical equipment of motor cars'.

Assistance has also been drawn from IEC 617 (Part 8) : 1983 and the corresponding IS 12032 (Part 8) : 1987 'Graphical symbols for diagrams in the field of electrotechnology: Part 8 Measuring instruments, lamps and signalling devices'.

It is also expected that this standard would be helpful in easy fault finding and rectification by the service stations.

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
9237 : 1979	Symbols for controls, indicators and tell-tales for road vehicles
9714 : 1993	Automotive vehicles — Symbols for controls, indicators and tell-tales for mopeds (*first revision*)
10043 : 1994	Automotive vehicles — Symbols for controls, indicators and tell-tales for scooters and motorcycles (*first revision*)
10479 : 1993	Automotive vehicles for operator controls and displays on scooters and motorcycles — Recommendations (*first revision*)

The committee responsible for the preparation of this standard is given in Annex A.

Indian Standard

AUTOMOTIVE VEHICLES — ELECTRICAL CIRCUITS — RECOMMENDED GRAPHICAL SYMBOLS

1 SCOPE

This standard covers the recommendations for graphical symbols for electrical, electronic equipment and measuring instruments used in the circuit diagrams of automotive vehicles.

2 GENERAL

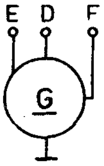
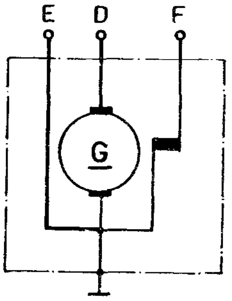
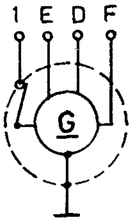
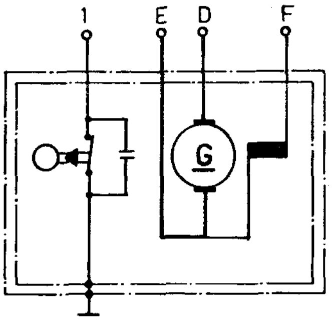
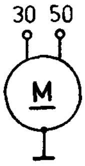
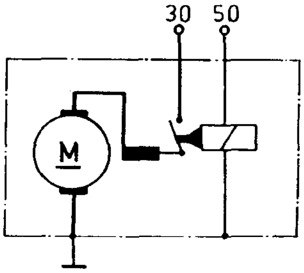
2.1 The symbols used shall be placed in the circuit diagram according to the relative position of the instrument/equipment in the vehicle.

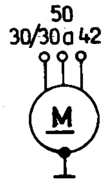
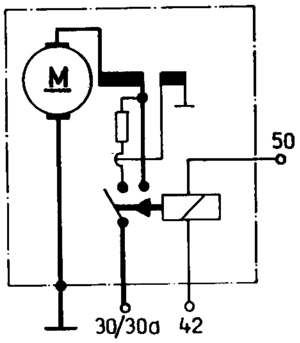
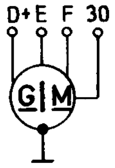
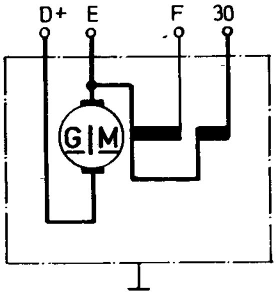
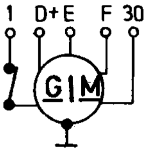
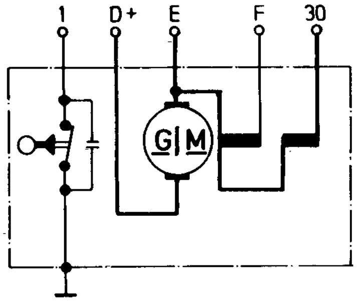
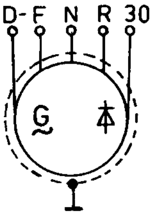
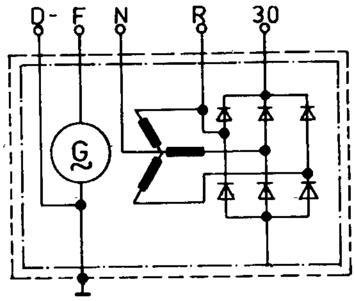
2.2 While drawing the circuit diagrams it is assumed that the rear of the vehicle is on the right of the circuit diagram.

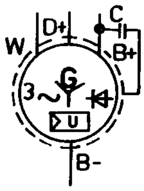
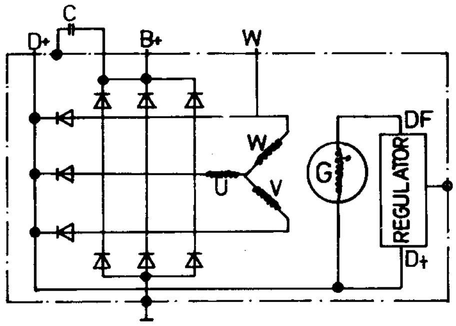
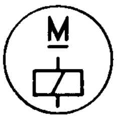
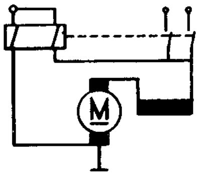
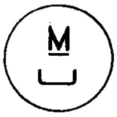
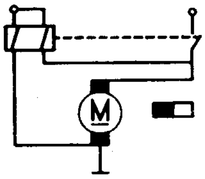
2.3 The numerical figures given in the illustration indicates the respective terminals.

2.4 Any other additional marking/symbols to indicate in the circuit are permissible as agreed between the manufacturer and the purchaser.

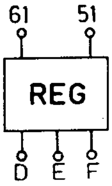
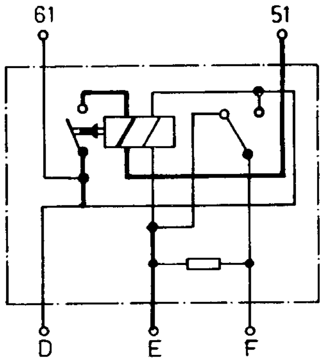
3 GENERATORS AND STARTERS

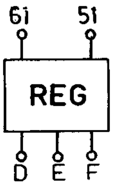
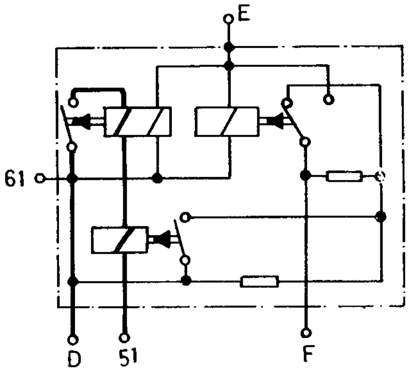
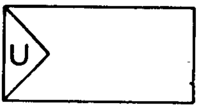
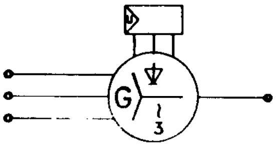
Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
3.1	dc-generator		
3.2	dc-generator with ignition device and radio interference suppressor		
3.3	Starter-single step switch		

Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
3.4	Starter-double step switch		
3.5	Combination dc-generator and starter		
3.6	Combination dc-generator and starter with ignition device		
3.7	AC-generator with built-in rectifier and radio interference suppressor NOTE — The following symbols to denote as voltage are also used: P, IG		

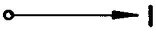
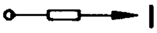
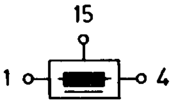
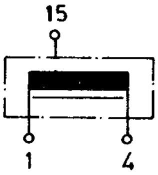
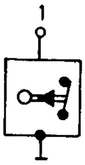
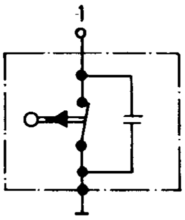
Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
3.8	ac- phase generator with built in regulator, rectifier and radio interference suppressor capacitor		 C D+ B+ W DF W U V G REGULATOR D+
3.9	Starter, motor, wound field type		
3.10	Starter, motor, permanent magnet type		

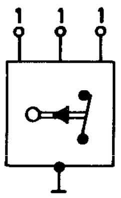
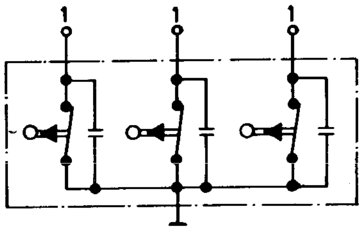
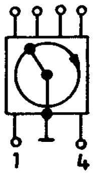
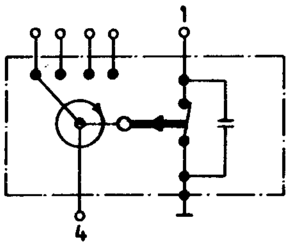
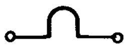
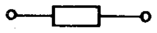
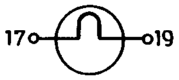
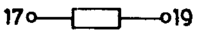
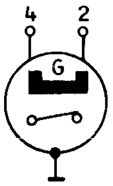
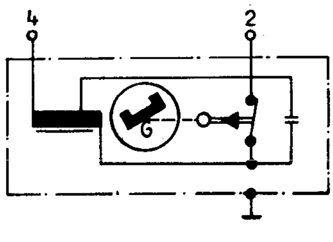
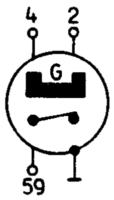
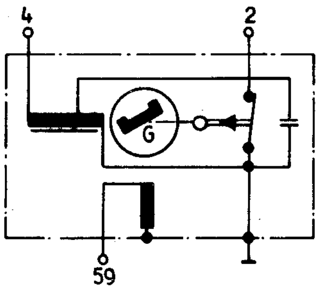
4 REGULATOR SWITCHES

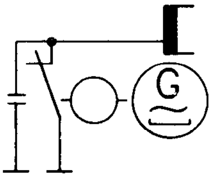
4.1	Regulators in general (for externally grounded generator)		

Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
4.2	Regulators with current limit and back current relay (for externally grounded generator)		
4.3	ac regulator		

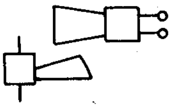
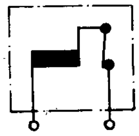
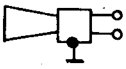
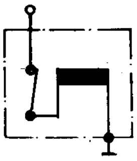
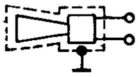
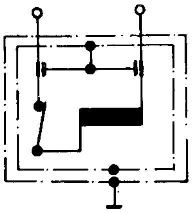
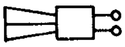
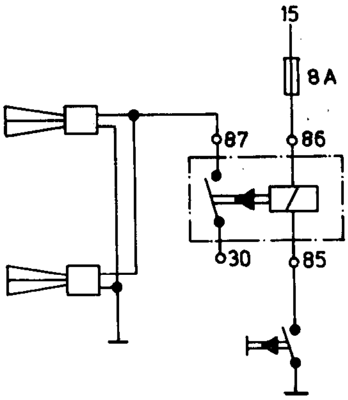
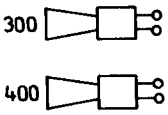
5 IGNITION AND COLD STARTER DEVICES

5.1	Spark plug		
5.2	Spark plugs with interference protective resistance		
5.3	Ignition coil		
5.4	Contact breaker with condenser; for example, for use with the single cylinder engine		

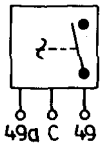
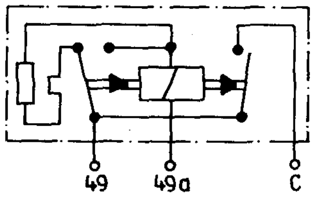
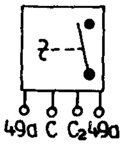
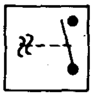
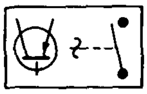
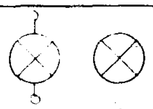
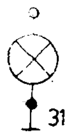
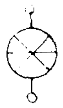
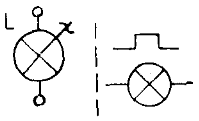
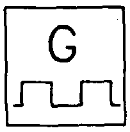
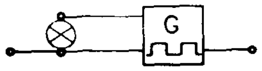
Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
5.5	Contact breaker with condenser; for example, for use with the three cylinder engine		
5.6	Distributor; for example, for four cylinder engine		
5.7	Glow plug		
5.8	Glow monitor		
5.9	Flywheel magneto; for example, for use with single cylinder engine		
5.10	Flywheel generator magneto; for example, for use with single cylinder engine		

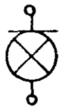
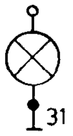
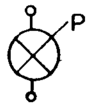
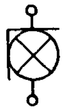
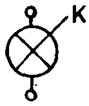
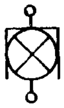
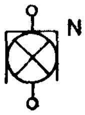
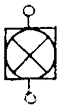
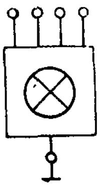
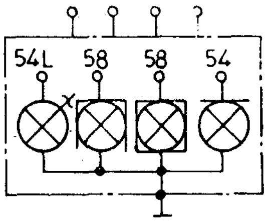
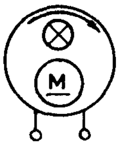
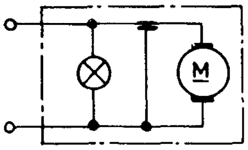
Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
5.11	Magneto with auto ignition system		None

6 ACOUSTIC SIGNALLING DEVICES

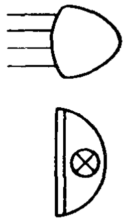
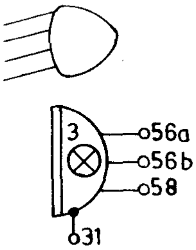
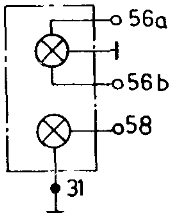
6.1	Horn		
6.2	Horn with one pole earthed		
6.3	Horn with suppressor		
6.4	Fanfars		
6.5	Double sound horn with indication of frequency, for example 300 and 400 Hz		

7 OPTICAL SIGNALLING DEVICES

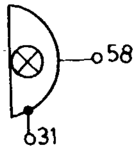
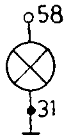
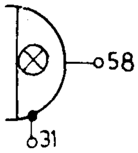
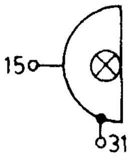
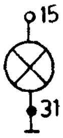
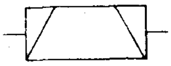
Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
7.1	Flashing-light generation in general		
7.2	Flashing light generators for vehicles with trailers		None
7.3	Flashing light generators for direction indicators and alarm		
7.4	Flashing light generators — electronically operated		
7.5	Lights in general		IS 12032 (Part 8) : 1987 
7.6	Pilot lights		
7.7	Flashing lights; for example left		
7.7.1	A C flasher		

Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
7.8	Brake light		IS 12032 (Part 8) : 1987 
7.9	Parking light		
7.10	Limiting light		
7.11	Indicator light		
7.12	Tail lamps, spacing light (markers)		
7.13	Fog tail light		
7.14	Reversing light		
7.15	Combination light consisting of flashing light — left, tail light, reversing light, brake light		
7.16	Warp around light		

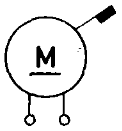
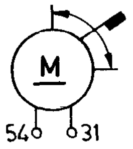
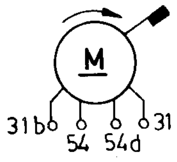
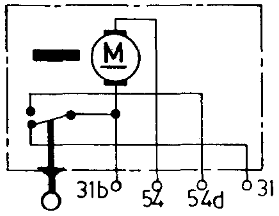
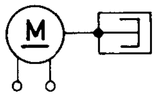
8 VISIBILITY IMPROVING DEVICES

Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
8.1	Head lamps in general		None
8.2	Head lamps with high beam dipped and parking		

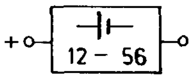
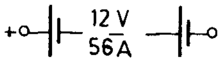
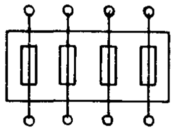
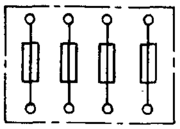
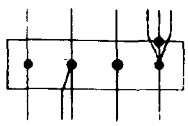
8.3 Additional Head Lamps

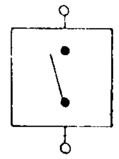
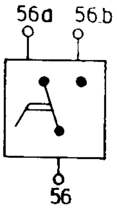
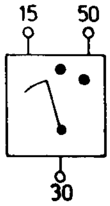
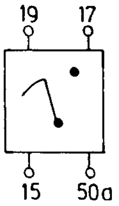
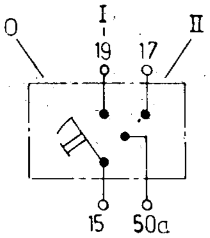
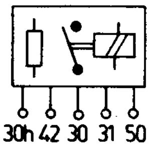
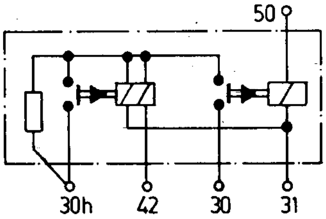
8.3.1	Fog head light		
8.3.2	Reversing head light		
8.3.3	Search light		
8.4	Clear-view plate		None

8.5 Windscreen Cleaning Means

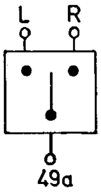
Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
8.5.1	Wiper motor, in general		None
8.5.2	Oscillating wiper motor		
8.5.3	Rotary wiper motor with terminal switch-off		
8.5.4	Motor driven pump; for example, for spraying water on windscreen		None

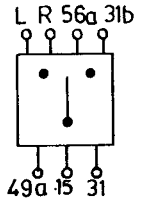
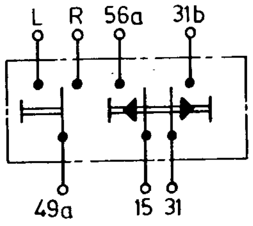
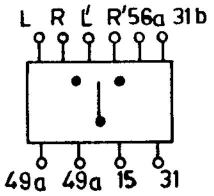
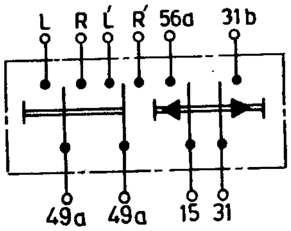
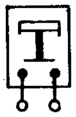
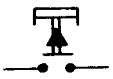
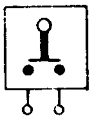
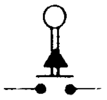
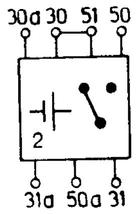
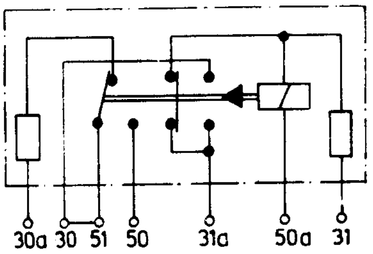
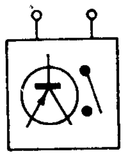
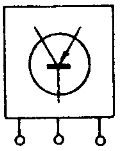
9 CURRENT SUPPLY, FUSES, TERMINAL STRIPS, SWITCHES

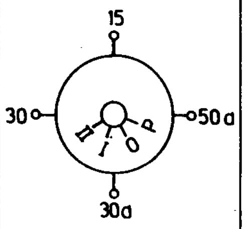
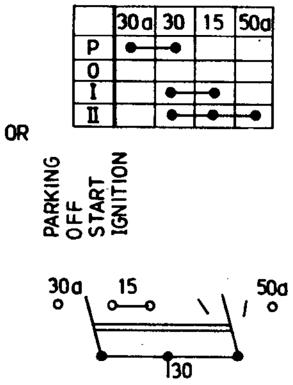
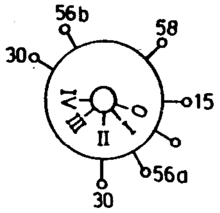
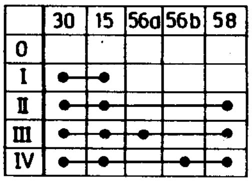
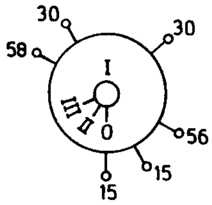
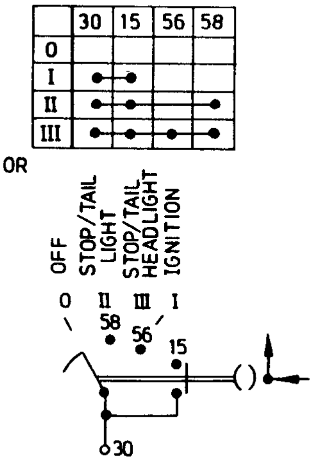
9.1	Storage battery; for example, 12V, 56A		
9.2	Fuse box; for example, with four fuses		
9.3	Strip for connecting wires; for example, connecting five wires with six wires		

Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
9.4	Switches, in general		None
9.5	Foot operated dipper switch		
9.6	Ignition switch		
9.7	Glow plug switch		
9.8	Starter switch		

9.9 Indicator Switches

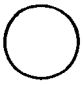
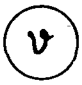
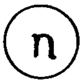
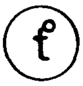
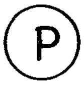
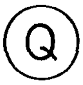
9.9.1	General		None

Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
9.9.2	Switch for single circuit; for example, for indicating turning direction, bypass signals, light and horn		
9.9.3	Switch for double circuit; for example, for indicating turning direction, bypass signals, light and horn		
9.10	Pressure switch — operated by the pressure of brake fluid		
9.11	Switch for brake light or for reversing light or for head light		
9.12	Electro-magnetic battery switch		
9.13	Electronic switch		None
9.14	Electronic control		None

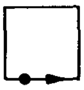
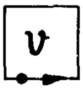
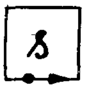
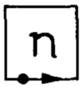
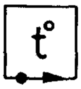
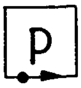
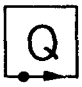
Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
9.15	Ignition starter switch rotary switch for starting, ignition and parking light [switching position 0 - I - II, O - P]		 30a 30 15 50a P O I II OR PARKING OFF START IGNITION 30a 15 50a 30
9.16	Switch boxes with five switching positions; for example: O = Off, I = Ignition, II = Stop and tail light III = Remote/tail/stop light IV = Dipping, tail light and stop light	 56b 58 30a 15 56a 30 IV III II I O	
9.17	Switch-boxes for ignition and light; for example, with four switching positions		 30 15 56 58 O I II III OR OFF STOP/TAIL LIGHT STOP/TAIL HEADLIGHT IGNITION O II III I 58 56 15 30

10 ELECTRICAL MEASURING DEVICE (METERS)

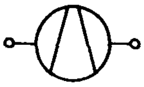
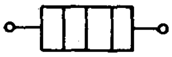
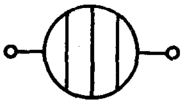
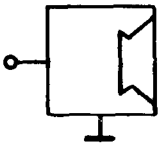
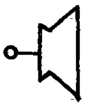
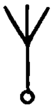
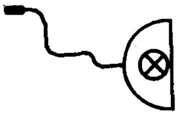
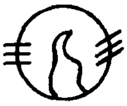
10.1 Electircal Measuring and Reading Instruments

Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
10.1.1	General		None
10.1.2	Speedometer		
10.1.3	Engine speed indicator		
10.1.4	Thermometer		
10.1.5	Pressure gauge; for example, for measuring air pressure		
10.1.6	Instrument for indicating fluid quantity		

10.2 Sensors for Electrical Measurements

10.2.1	General		None
10.2.2	Sensors for vehicle speed	 	
10.2.3	Sensors for engine speed		
10.2.4	Sensors for temperature		
10.2.5	Sensors for pressures		
10.2.6	Sensors for fluid quantity		

11 OTHER ELECTRICAL DEVICES

Clause	Name of equipment/ instrument	Symbol	Example for use of symbol in circuit diagram
11.1	Blower		None
11.2	Heater		
11.3	Cigarette lighter		
11.4	Radio		
11.5	Speaker		
11.6	Aerials, in general		
11.7	Hand lamps		
11.8	Heating and ventilation independent of the engine		

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Automotive Electrical Equipment Sectional Committee, TED 11

Chairman	*Representing*
Shri K. R. Anandakumaran Nair	Lucas TVS Limited, Madras
Members	
Shri C. Ranganathan (*Alternate* to Shri K. R. Anandakumaran Nair)	
Shri Anil Anand	Lumax Industries Pvt Ltd, New Delhi
Shri S. A. Latif (*Alternate*)	
Shri A. Bandhopadhyay	DCSSI, New Delhi
Shri Tapan Basu	Bajaj Auto Ltd, Pune
Shri T. M. Balakaman (*Alternate*)	
Shri G. K. Binani	Hindustan Motors Ltd, Calcutta
Shri V. Chandrasekaran	Tractors and Farm Equipment Ltd, Madras
Shri R. Ranganathan (*Alternate*)	
Shri S. K. Gulati	DTDP (Air), Ministry of Defence, New Delhi
Shri D. Gangopadhyaya (*Alternate*)	
Shri K. C. Jain	Escorts Ltd, Faridabad
Shri R. K. Gupta (*Alternate*)	
Shri R. K. Jain	HMT Ltd, Distt Ambala
Shri R. K. Sehgal (*Alternate*)	
Shri R. M. Kanitkar	Bajaj Tempo Ltd, Pune
Shri S. B. Dugal (*Alternate*)	
Shri R. Kumar	Tractor Components Group Escorts Ltd, Faridabad
Shri A. Jindal (*Alternate*)	
Shri V. A. Kalgaonkar	Tata Engineering and Locomotive Co Ltd, Pune
Shri D. R. Yadav (*Alternate*)	
Shri R. Khandelwal	Indian Society for Lighting Engineers, Mumbai
Shri A. R. Kulkarni	C Q A V, Ahmednagar
Lt Col B. K. Malhotra (*Alternate*)	
Shri C. B. S. Menon	Ashok Leyland Ltd, Madras
Shri A. J. Suriyaprakash (*Alternate*)	
Shri O. Murigeppa	Sahney Paris-Rhone Ltd, Hyderabad
Shri V. C. Mathur	DGTD, New Delhi
Shri C. P. Mathur	Motor Industries Company Ltd, Bangalore
Shri V. Badriprasad (*Alternate*)	
Shri S. K. Mukherjee	Mahindra and Mahindra Ltd, Mumbai
Shri S. Mohan	Best and Crompton Engineering Ltd, Madras
Shri S. John Augustine (*Alternate*)	
Shri R. K. Manrao	Punjab Tractors Ltd, Ropar
Shri Anand Swarup (*Alternate*)	
Shri K. Narayanan	SRF Nippon Denro Ltd, P. O. Tilpatta
Shri N. Ramanathan (*Alternate*)	
Shri P. S. Pattabhiraman	FIEM Industries (P) Ltd, Kundli
Shri C. B. Pundlik	Finolex Cables Ltd, Pune
Shri E. M. Pithambaran	Ministry of Defence (DRDO), Ahmednagar
Shri S. K. Chatterjee (*Alternate*)	
Shri G. N. Parad	Maharashtra State Road Transport Corporation, Ratnagiri
Dr S. B. Roy	Chloride India Ltd, Calcutta
Shri I. V. Rao	Maruti Udyog Ltd, Gurgaon
Shri K. C. Hallone (*Alternate*)	
Shri A. K. Rai	Vehicle Factory, Jabalpur
Shri B. L. Pathariya (*Alternate*)	
Shri R. K. Sarine	Auto Ignition Pvt Ltd, Faridabad
Shri U. S. Prabhu (*Alternate*)	
Shri I. Sondhi	J. M. A. Industries Ltd, New Delhi
Shri Kuldip Singh (*Alternate*)	
Shri Sadhu Singh Sidhu	Pepsu Road Transport Corporation, Patiala

(*Continued on page* 17)

(Continued from page 16)

Members	*Representing*
Shri S. S. Sandhu Shri P. N. Rangan (*Alternate*)	ARAI, Pune
Shri S. N. Srinivasan Shri H. S. Dave (*Alternate*)	Premier Automobiles Ltd, Mumbai
Shri K. E. Sanath Kumar Shri U. S. Seth (*Alternate*)	National Test House, Madras
Shri S. V. Srinivasa Shri Jaipal (*Alternate*)	International Instruments Ltd, Bangalore
Shri N. V. Sridharan Shri Dilip P. Patel (*Alternate*)	Addon, Bangalore
Shri S. R. Tapade Shri P. C. Barjatia (*Alternate*)	Central Institute of Road Transport, Pune
Shri O. P. Tiwari Shri A. A. Vatsyayan (*Alternate*)	DCM Daewoo Motors, New Delhi
Shri Uma Shankar Shri P. R. Govindan (*Alternate*)	India Nippon Electricals Ltd, Dharampuri
Shri V. S. Venkatesan Shri M. V. Ramdoss Rao (*Alternate*)	Brakes India Ltd, Madras
Shri A. R. Gulati, Director (Transport Engineering)	Director General, BIS (*Ex-officio Member*)

Member Secretary

Shri M. V. S. D. Prasada Rao
Joint Director (Transport Engineering), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act. 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. TED 11 (5136).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 323 01 31, 323 94 02, 323 83 75

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices:

		Telephone
Central :	Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17 323 38 41
Eastern :	1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	337 84 99, 337 85 61 337 86 26, 337 86 62
Northern :	SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43 60 20 25
Southern :	C. I. T. Campus, IV Cross Road, MADRAS 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western :	Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. PATNA. THIRUVANANTHAPURAM.

Printed at New India Printing Press, Khurja, India